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THE CLASSIFICATION OF THE MAYAN LANGUAGES

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1. Previous classifications
2. The present classification

1. The earliest attempt at internal classification of the Mayan languages is that of Otto Stoll.[1] Stoll (pp. 45–70) compared vocabularies of the various languages accessible to him. On the basis of such lexical inspection and the observations on shared items resulting therefrom he produced the following scheme (pp. 173–5 and *Anhang*) (with the languages arranged in the order of their successive splitting off from the main stock):

A. Huastec
B. 1. Yucatec (= Maya)
   2. (Mopan)
C. 1. Chontal
   2. Tzeltal (= Tzental)
   3. Tzotzil
   4. Toholabal (= Chaneabal)
   5. Chol
D. 1. Kekchi (= Quekchi)
   2. a. Pokonchi
      b. α. Pokomam
         β. Chorti
E. 1. a. Cakchiquel
      b. Tzutuhil
   2. a. Quiche
      b. Uspantec
F. 1. Ixil
   2. a. Mam
      b. Aguacatec

A more recent classification, likewise based on inspection of vocabularies, is that of A. L. Kroeber.[2] This grouping is considerably more detailed and admits of some degree of secondary contact. A tabular presentation of Kroeber's scheme follows:

A. Lowland Maya
   1. a. Huastec
      b. Chicomuceltec
   2. a. α. Yucatec (= Maya)
         β. Mopan
         γ. Lacandone
      b. α. Chontal
         β. Chol
         γ. Chorti
   3. a. α. Tzeltal (= Tzental)
         β. Tzotzil
      b. Toholabal (= Chañabal)
      c. Chuh (= Chuj)
   4. a. Kanhobal (= Jacaltec)
      b. Motozintlec
B. Highland Maya
   1. Mam
   2. Aguacatec
   3. a. α. Cakchiquel
         β. Tzutuhil
         γ. Quiche
         δ. Uspantec
   4. a. Kekchi
      b. α. Pokomam
         β. Pokonchi

The closest contacts of Huastec-Chicomuceltec are with a special group consisting of Chontal-Chol-Chorti and Tzeltal-Tzotzil. Likewise fairly close contacts are found between Kanhobal and Tzeltal-Tzotzil-Toholabal-Chuh as also between Kekchi and Chontal-Chol-Chorti. The first split in the

[1] Otto Stoll, Zur Ethnographie der Republik Guatemala, Zürich, 1884, pp. 45–70, 173–5, *with* Anhang: Schematischer Stammbaum der Maya Sprachen.

[2] L. Kroeber, Cultural and Natural Areas of Native North America, Berkeley, 1939, pp. 112–114 [= UCPAAE 38].

family would seem to be between A (Lowland) and B (Highland). Subsequent splits are as indicated by the hierarchy of numbers and letters.

The only classification published to date which is based on phonology (a partial study) is that of A. M. Halpern.[3] Halpern's classification is founded explicitly on sound correspondences and, accordingly, on assumed shared shifts among languages in portions of the area. Halpern's scheme follows:

A. Huastec
B. Yucatan-Guatemala
  1. Yucatec
  2. Quichoid
    a. α. Cakchiquel
      β. Tzutuhil
      γ. Quiche
      δ. Uspantec
    b. α. Kekchi (= Quekchi)
      β. Pokomam
  3. Mamoid
    a. α. Mam
      β. Aguacatec
    b. Kanhobal (= Jacaltec)
C. Chiapas
  1. a. Tzeltal (= Tzental)
    b. Tzotzil
  2. a. Chontal
    b. Chol
    c. Chorti
  3. Toholabal
  4. Chuh (= Chuj)

Stoll, Kroeber, and Halpern all agree in separating Huastec from the rest of the family and in certain minor sub-groupings: Yucatec, Cakchiquel-Tzutuhil-Quiche-Uspantec, Kekchi-Pokomam, and Mam-Aguacatec. All three likewise agree in assuming a special sub-grouping consisting of Tzeltal-Tzotzil and Chontal-Chol. Kroeber and Halpern agree in combining Chuh with these. Stoll and Halpern place Toholabal with both of these pairs, Kroeber only with Tzeltal-Tzotzil. Stoll and Kroeber agree in linking Pokonchi with Pokomam.

Stoll disagrees with the others in putting Chorti with Pokomam rather than with Chontal-Chol. Halpern disagrees with Kroeber in linking Tzeltal-Tzotzil-Toholabal-Chuh in the first instance with Chontal-Chol-Chorti. Kroeber ties the latter in the first instance to Yucatec, but allows secondary contacts with the Chiapas languages. Stoll places Ixil in the same group as Mam-Aguacatec, whereas Kroeber combines it in the first instance with Cakchiquel-Tzutuhil-Quiche-Uspantec. Kroeber combines Kanhobal with Motozintlec (allowing for special secondary contacts with the Chiapas languages), where Halpern places it with Mam-Aguacatec.

2. The present classification is based on a fair amount of work on the comparison of lexical items in those three of the languages of the family (Huastec, Mam, and Yucatec) for which adequate descriptive materials[4] are available, and on sound correspondences ensuing therefrom—resulting in a preliminary sound-correspondence matrix[5] (for Mam, Huastec, and Proto-Mayan). With all the other languages of the family (except Chontal, Lacandone, and Ixil) the writer has had personal experience to the extent of gathering a fairly sizable vocabulary and to the point of working out a preliminary phonemic outline.[6] For the three exceptions the phonemic analyses of other workers have been made available (Kathryn Kellar's,[7]

[3] A. M. Halpern, A Theory of Maya tš-Sounds, Washington, 1942 [= Carnegie Institution of Washington, Division of Historical Research, Notes on Middle American Archaeology and Ethnology, No. 13, December 20, 1942].

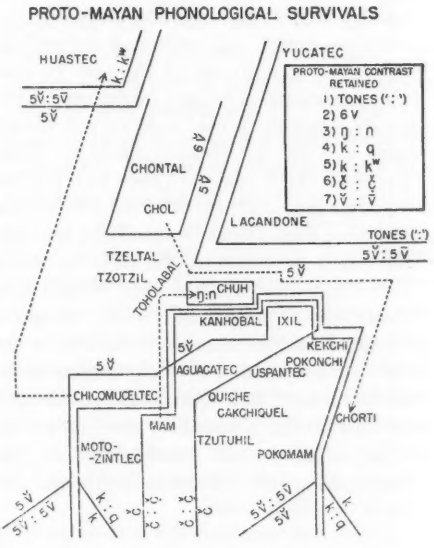
[4] In the files of the Macro-Mayan Linguistic Research Project of the Department of Anthropology of the University of Chicago. Both Andrade (Manuel J.) and McQuown contributed first-hand materials on these three languages.

[5] N. A. McQuown, The Indigenous Languages of Latin America, AA 57.501–70 (1955), pp. 506–7.

[6] Materials available in the files of the Macro-Mayan project.

[7] In materials made available through the Mexican branch of the Wycliffe Bible Translators.

Philip Baer's,[7] and Edward Sywulka's[8] respectively). For the purposes of the present distributional survey (which makes use of seven phonological proto-contrasts), the writer has further assumed what is not at present demonstrable (although it seems not unlikely), namely, that Proto-Mayan had tonal distinctions whose domain was the syllable and that it had six vowels. The existence of the remaining five contrasts can easily be shown with the materials which served to build up the preliminary sound-correspondence matrix. A charting of these seven contrasts (whether merely assumed or actually demonstrable) gives the interesting survival distributions to be found in the accompanying maps.



Vowel quantity survival characterizes three points of a triangle occupied by Huastec, Yucatec, and Highland Guatemalan languages (edging over the border

[8] In a personal communication.

into Chiapas). The k:q contrast is characteristic only of the last of these three points. The ŋ:n contrast survived in a fully exploited form only in Chuh. Although it is present in Mam, its distribution there is extremely limited (only in word-final). The k:kʷ contrast survived only in Huastec. The contrast between č and č̣ cross-cuts the vowel-quantity line but survives in some only of those Highland Guatemala languages in which the k:q contrast still appears. Six vowels are still present only in Chontal and in Chol. A contrast between high (ˊ) and low (ˋ) tones still exists only in Yucatec. Special connections between Huastec and Chicomuceltec (which share particular lexical items found only in them), Mam and Chuh (which share ŋ survival, although they differ sharply in most other respects), and Chol and Chorti (which are separated phonologically only by the line between a six vowel and a five vowel system), although they do not, perhaps, properly belong on a survival chart, are indicated by arrows. If the points of the triangle may be thought of as long-established differentiated blocks, the arrows may be considered as possibly indicating migration corridors.

If one were to roll up two of the outliers of a block constituted by the non-Yucatec non-Guatemala Highland languages of the family, that is, if one were to roll Chorti back on Chol and Huastec back on Chicomuceltec, and if one were then to bring the Yucatec into contact with the Guatemala Highland mass (without specifying the precise point of contact), the area in which vowel quantity is distinctive would then constitute a continuum (from Huastec-Chicomuceltec on the west to Kekchi on the east) and would be neatly opposed to the Kanhobal-Chuh-Toholabal-Tzotzil-Tzeltal-Chorti-Chol-Chontal axis running roughly from south (north edge of the Guatemala and Chiapas highlands) to north (the Gulf Coast).

If one now considers the various parts of the survival chart from the point of view of the NUMBER of proto-contrasts retained, it is immediately apparent that the Guatemala Highland area, and, more specifically, that part of it which contains Mam, Aguacatec, and Ixil, is the most conservative. From this same point of view, the Chuh-Toholabal-Tzotzil-Tzeltal-Chorti-Chol-Chontal axis is the most innovating. The fact that Chuh, Chol and Chontal, in this axis, and Huastec, and Yucatec, at two points of the triangle, are each characterized by unique surviving features (ŋ, 6 V̆, kʷ, and tones, respectively), indicates nothing more than the normal random distribution of different single survivals. Kanhobal (with loss of V̆:V̄ contrast, but with retention of k:q and č:č̣ contrasts) occupies an intermediate position. If the unique survivals are discounted, the Guatemala Highlands stand out even more as the more conservative, with Kanhobal, Huastec (coupled presumably with Chicomuceltec), and Yucatec in an intermediate position, and the languages in the Chuh-Chontal axis at the innovating extreme. The conclusion that the Guatemala Highland languages (and, most specifically, Mam, Aguacatec, and Ixil) are the more conservative does not, of course, imply that they are uniformly so, since these languages have their share of randomly distributed unique innovations. The conclusion is quantitative, not qualitative.

A cautious sub-grouping of the Mayan languages, based in part on this mapping of shared retentions, in part on an impressionistic sampling of the lexical material in the vocabularies which served as a basis for the working out of the phonology, might result in a scheme like the following:

A. Huastecan
   1. Huastec
      a. Veracruzano
      b. Potosino
   2. Chicomuceltec
B. Cholan
   1. Chontal
   2. Chol
   3. Chorti

C. Tzeltalan
  1. Tzeltal
  2. Tzotzil
  3. Toholabal
D. Chuh
E. Kanhobalan
  1. Jacaltec
  2. Kanhobal
  3. Solomec
F. Motozintlec
G. Mamean
  1. Mam
  2. Aguacatec
  3. Ixil
H. Quichean
  1. Rabinal
  2. Uspantec
  3. Quiche
  4. Cakchiquel
  5. Tzutuhil
I. Kekchian
  1. Kekchi
  2. Pokonchi
  3. Pokomam
J. Maya proper
  1. Yucatec
  2. Lacandone
  3. Itza
  4. Mopan

A less cautious sub-grouping would combine B and C, D and E, F and G, and H and I.

This suggested sub-grouping agrees with Stoll, Kroeber, and Halpern in assigning Huastec to a separate group (and with Kroeber in bracketing Chicomuceltec with Huastec), in combining Tzeltal, Tzotzil, and Toholabal, in joining Mam and Aguacatec (and with Stoll in combining Ixil with these), in linking Cakchiquel, Tzutuhil, Quiche, and Uspantec (adding Rabinal), and in placing Kekchi and Pokomam in a single group. It agrees with Stoll and Kroeber in joining Pokonchi with Kekchi-Pokomam, in combining Mopan with Yucatec (and with Kroeber in including Lacandone) (adding Itza), with Stoll and Halpern in bracketing Chontal-Chol with Tzeltal-Tzotzil-Toholabal, and with Kroeber and Halpern in placing Chorti with Chontal and Chol. It differs from Halpern in separating Kanhobal from Mamean and in being reluctant to combine Yucatec directly with the Guatemala Highland languages. It differs from Kroeber in linking Chuh with Kanhobal rather than with Tzeltal-Tzotzil-Toholabal, in linking Motozintlec with Mam rather than with Kanhobal, and in suggesting a closer link between Quichean and Kekchian than between Quichean and Mamean. It differs from Stoll ONLY in assigning Chorti to Chontal-Chol (rather than to Pokomam).

The differences are attributable (1) to a more accurate knowledge of the phonology (in almost all cases), coupled with a greater insistence than Halpern's on phonetic plausibility for suggested phonemic changes, and (2) to the availability of more adequate vocabularies for most of the languages.

Only when more thorough descriptive studies, grammatical and lexical, of more languages (say Chol, Tzotzil, Chuh, Ixil, Tzutuhil, and Pokonchi) are available will further comparison be possible, and, on the basis of such comparison, will further refinement of the sound-correspondence matrix be feasible. With such refinement, one can then hope to delineate the sub-groups more sharply, and, in turn, to subdivide these groups with greater confidence. Eventually the dispersal and differentiation of the proto-language will be traceable step-by-step, and a careful separation, subsequent to each step, of the inherited from the borrowed material, and a tracking down of the latter to its sources, will make it possible to trace the cultural history of the Mayan peoples as this is reflected in the Mayan languages.

SYLLABIFICATION IN KUTENAI

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1. Introduction
2. Kutenai consonant clusters
3. Minimal and maximal syllable
4. Onset
5. Coda
6. Interlude
7. The syllable in Kutenai

1. The description of phoneme disribution is variously handled in recent studies, some using the word, others the contour, still others the syllable as their unit.[1] The growing importance of distribution as a part of linguistic description makes it of interest to examine this problem more closely. Without extensive first-hand research in these languages it would be impossible to be sure whether the difference is determined by the languages themselves or by the linguist's predilections. The present paper is intended to show for one language which has a large number of consonant clusters that it is possible to bring out the structural principles of distribution best if one adopts the syllable as one's descriptive unit. As the writer has pointed out elsewhere, the attempt to find phonetic criteria for syllable division appears to be futile.[2] Morphological boundaries are often marked by juncture, which at the same time marks syllable boundaries; but these will here be disregarded. We are only concerned with the point of division where there is no juncture. It is our hypothesis that there is an optimal point at which the intervocalic clusters can be divided to give a description of phoneme distribution in terms of the syllable. We assume that this will be the same for all clusters of identical length and that it can be stated in general terms for clusters of any length. The basis for this division will be the occurrence of consonants initially and finally, on the assumption that if a syllable means anything at all, it is a unit of limited and therefore recurrent phoneme sequences. Everyone talks about syllables, but no one seems to do anything about defining them. Yet the only real basis for assuming their existence is that speakers of the language can utter them separately, dividing utterances into sequences that seem natural when pronounced alone. This is the pragmatic justification for making syllabic cuts on the basis of initial and final clusters. The data on which it is based is drawn from Paul Garvin's description of Kutenai, which lists all occurring clusters, but classifies them only in terms of contours (contour-initial, -medial, -final).[3]

2. The consonant clusters of Kutenai listed by Paul Garvin number in all 417, of which 81 initial, 309 medial, 27 final. Our procedure will be to analyze the initial and final clusters and see whether all the medial can be unambiguously divided into final plus initial clusters. The consonants of the language are stops /p t k q ʔ/, spirants /s ɬ x h/, affricates /c č/, nasals /m n/, voiced lateral /l/, semivowels /w y/. Omitting /č/, which occurs only in loanwords, Garvin divides the rest into class I and

[1] E.g. M. Swadesh, Unsaliq and Proto-Eskimo II, IJAL 18.25-34 (1952), L. C. Hanes, Phonemes of Motilone (Carib), IJAL 18.146-9 (1952), P. W. Fast, Amuesha (Arawak) Phonemes, IJAL 19.191-4, who speak of word initial, medial, or final positions; Garvin (see reference below) speaks of the contour; most others use the syllable; see esp. Kenneth L. and Eunice V. Pike, Immediate Constituents of Mazateco Syllables, IJAL 13.78-91 (1947) and C. F. Hockett, Short and Long Syllable Nuclei, IJAL 19.165-71 (1953).

[2] Einar Haugen, The Syllable in Linguistic Description, to appear in the Jakobson volume.

[3] Paul Garvin, Kutenai I: Phonemics, IJAL 14.37-42 (1948).

II on the basis of their distribution, I being the voiceless consonants /p t k q s ɬ x c/, II the voiced /ʔ h m n l w y/.

3. The minimal syllable has the form CV; all consonants occur. We shall call this the NUCLEUS (in Hockett's terms the "peak"), and distinguish it from the MARGINS.[4] It can be preceded and followed by zero to three consonants. The theoretical maximal syllable is thus $^{ccc}CV^{ccc}$. Using Hockett's terminology, we shall call the PRENUCLEAR margin the ONSET and number the consonants as follows: $C_1C_2C_3$-. The post-nuclear margin we shall call the CODA and number as follows: -$C_1C_2C_3$. The intervocalic margin we shall call the INTERLUDE and number as follows: -$C_1C_2C_3C_4C_5$-.

4. Initial C_1- is limited to Class I (the voiceless); after C_1 all C can occur (except /h/); for occurring sequences see Table 1.

TABLE 1

C_1- \ C-	p	t	k	q	ʔ	s	ɬ	x	c	m	n	l	w	y
p												pl		py
t			tk		t?									
k	kp	kt	kk	kq	k?	ks	kɬ	kx	kc	km	kn	kl	kw	ky
q			qk		q?	qs								
s		st	sk	sq			sɬ				sn		sw	
ɬ	ɬp		ɬk	ɬq	ɬ?		ɬɬ							
x										xm				
c		ct	ck	cq	c?	cs	cɬ	cx		cm				

4.1. The sequence $C_1C_2C_3C$ occurs only in 10 different varieties, so that it may be chance which ones happened to be found in the material. The membership of C is still Class I plus II but now reduced to /k q ʔ s ɬ x m/; hence we divide first into $C_1C_2C_3/C$. Any attempt to divide C_1/C_2C_3C leaves us with 5 of the 10 as not occurring in earlier lists. The examples of $C_1C_2C_3$ are only five in number; only the division C_1C_2/C_3 enables us to account for all of them in terms of C_1C clusters. This gives us the clusters /ks kɬ kc sq ck/ occurring initially and followed by /ʔ ɬ c/; the actual sequences are shown in Table 3.

TABLE 2

$C_1(C_2)$- \ C-	k	q	ʔ	s	ɬ	x	c	m	w	y
k	ksk	kɬq kcq	kk? kq? kɬ? kc?	kɬs	ksɬ	kcx		kɬm		key
s	sqk	sɬq	sq? sɬ?		sɬɬ	sɬx	sɬc		sɬw	
ɬ				ɬqs		ɬcx				
c	ckk c?k			cqs	ckɬ			cxm		cky

The sequence C_1C_2C can be regarded as consisting either of C_1C with C_2 inserted, of

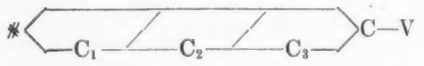
[4] Charles Hockett, A Manual of Phonology p. 52, IUPAL, Memoir 11 (1955).

TABLE 3

$C_1(C_2C_3)$-									
	k s c	kc?k	kslq	ksł?	kłc?	ksls	kłcł	kłcx ekcx	kłcm sq?m
		k	q	?		s	ł	x	m

C-

4.2. To summarize the onset: (1) Position C may be occupied by any consonant, but as pre-nuclear consonants are added, the number actually occurring is reduced (all initially, all but /h/ after C_1, dropping /p t n l/ after C_1C_2, /c w y/ after $C_1C_2C_3$); (2) the onset may be occupied by any consonant of class I, to which may be added /?/ in non-initial position; (3) only those sequences can occur in the onset which can also occur before vowels (C_1C), but not all of the latter (exception: /łc/); (4) the onset consists of clusters of two to which a third consonant may be added. A diagram describing the onset is as follows:



This diagram is to read as follows: after juncture a syllabic nucleus must open with a consonant (C), but may be preceded by from one to three consonants ($C_1C_2C_3$-) A formula to describe their composition would read: $C_1 = C_{v1}$ (before C_2 = kslc, before C_2C_3 = ksc); $C_2 = C_{v1} - pt + ?$ (before $C_3 = C_{v1} - ptx$); $C_3 = ?łc$.

5. Any C except /h/ may occur as final C_1. But not all are followed by C_2, as appears from Table 4 listing the occurring sequences.

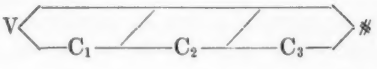
-C_1

p	t	k	q	?	s	ł	x	c	m	n	l	w	y	
		kp kt			st	łt								p t k ?
pk				?k									yk	
	t?	k?	q?											s
ps	ts tc	ks		?s		łs			ms	ns		ws	ys	c m n
				?m ?n										

-C_2

TABLE 4

-C_1 is still further restricted in -$C_1C_2C_3$, but the material is too small to draw any conclusions; only five such clusters occur, viz. /t?s k?p k?s q?s ?ks/. All of these can be accounted for as C_1C_2 clusters /t? k? q? ?k/ with /s/ or /p/ added. If the coda is compared with the onset, the clusters show a tendency to reverse order (mirror effect). Of the 22 CC-clusters listed above, 15 do not occur initially; of these 7 are limited to final position (łt ps ?s ms ys ?m ?n), 8 occur in reversed order initially (pk ?k yk ts łs ns ws tc). The remaining 7 occur also initially; of these 5 occur in the same order as finally (kp st t? k? q?), 2 can also be reversed (kt ks). The following diagram describes the coda:



This diagram is to be read as follows: before juncture a syllabic nucleus may be followed

by zero, one, two, or three consonants. A formula to describe the membership of the positions is: C_1 = C − h (before C_2 = C − hxcl; before C_2C_3 = tkqʔ); C_2 = C − qɬxlwy (before C_3 = kʔ); C_3 = ps.

6. Intervocalic consonants may number from one to five. We shall attempt to assign these to the preceding or following vowel by comparing their distribution with that of the onsets and codas listed above. In Hockett's terms: we shall divide the interlude into coda plus onset, not on phonetic but on structural grounds. The point of division will be marked by a dot.

6.1. One consonant. Any consonant (including /h/) may occur in the sequence VCV. Since V does not occur initially, and the C_1- permits all consonants, -C_1- must be assigned to the following V and the sequence divided V.CV. For the same reason we shall see that the last consonant in any interlude must be assigned to the following V.

6.2. Two consonants. Two possible divisions of -C_1C_2- may be considered, V.CCV or VC.CV. All consonants (except h) occur in C_1, while all (including h) occur in C_2. This makes the sequences of -CC- markedly different from those of CC- or -CC, both of which are quite restricted. While CC- includes 41 sequences and -CC only 22, the -CC- number 134. This is 68.4 per cent of the potential total of 14 × 14 or 196 sequences. We recall that initial and final positions are the only ones in which all or nearly all C's occur; hence it seems natural to divide VC.CV, so that the first C is the coda of the preceding syllable, the second the onset of the following one. The sequences that actually occur are as follows: (Table 5.)

TABLE 5

-C_1- \ -C_2-	p	t	k	q	ʔ	s	ɬ	x	c	m	n	l	w	y
p		pt	pk	pq		ps	pɬ	px	pc	pm	pn	pl		py
t			tk	tq	tʔ	ts	tɬ	tx	tc	tm	tn	tl	tw	
k	kp	kt	kk	kq	kʔ	ks	kɬ	kx	kc	km	kn	kl	kw	ky
q		qt	qk		qʔ	qs	qɬ	qx	qc	qm	qn		qw	
ʔ		ʔt	ʔk	ʔq		ʔs	ʔɬ	ʔx		ʔm	ʔn		ʔw	
s	sp	st	sk	sq	sʔ	ss	sɬ	sx	sc	sm	sn	sl	sw	
ɬ	ɬp	ɬt	ɬk	ɬq	ɬʔ	ɬs	ɬɬ	ɬx	ɬc	ɬm	ɬn		ɬw	
x		xt						xx		xm	xn		xw	
c		ct	ck	cq	cʔ	cs	cɬ	cx	cc	cm	cn		cw	
m		mt	mk		mʔ	ms	mɬ	mx	mc	mm	mn		mw	
n		nt	nk	nq	nʔ	ns	nɬ	nx	nc	nm	nn			ny
l												ll		
w						ws	wɬ	wx					ww	wy
y		yt	yk	yq		ys	yɬ	yx	yc	ym	yn		yw	

6.3. Three consonants. The number of such clusters is 135, including three which have /h/ as their last member. All consonants occur in position C_3, all except /h l w y/ in C_2, and all except /h x l w/ in C_1. As before we may identify C_3 as belonging with the following vowel. This leaves three possible divisions: V.CCCV, VC.CCV, VCC.CV. The first would require similarity between -CCC- and CCC-; but the former has many more sequences (135 to 28) and the membership in position C_1 in each case is very different, being limited initially to /k s ɬ c/. The second division would invite comparison between -C_1- and -C_1 on the one hand, between -C_2C_3- and C_1C- on the other. The absence of /x l w/ from the -C_1- makes it quite unlike the final -C_1, where all consonants occur, but quite like the -C_1 before -C_2, where /x c l/ are missing. The last two consonants

are rather unlike initial clusters also: they have no /m- n- ʔ-/ and no /-l/. The third division is the only one left. As stated, the $-C_1C_2-$ is much like the final $-C_1C_2$, though it has a few more sequences (/c-, -q, -ł, -x/): hand, C_2 does not agree too well with the membership of $-C_2$ either: it adds /q ł/ and lacks /m n/, and only 9 of the 25 clusters are also final. C_3 cannot be identified with final C_3, but agrees fairly well with

-C₁-														
p	t	k	q	ʔ	s	ł	x	c	m	n	l	w	y	
		kp												p
		kt	qt	ʔt	st	łt				nt				t
pk	tk	kk	qk	ʔk	sk	łk		ck		nk				k
pq	tq	kq			sq	łq		cq		nq			yq	q
	tʔ	kʔ	qʔ					cʔ						ʔ
ps	ts	ks	qs	ʔs		ls			ms	ns				s
	tł	kł		ʔł	sł					nł				ł
px						łx				nx				x
	tc	kc	qc		sc	łc				nc				c
				ʔm										m
				ʔn		łn								n

-C₂-

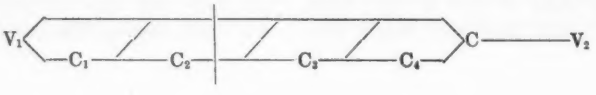
TABLE 6

Although Table 6 is more filled out than in the case of the finals, the similarity in the use of /ʔ m n/ will be noted. The two latter never occur before consonants in initial clusters.

6.4. Four consonants. The number of these clusters is only 29, which makes it difficult to analyze them with any assurance. Not one of them coincides with the initial CCCC- clusters, which excludes the possibility of assigning all four to the following syllable. The memberships are as follows: C_1 /p t k q ʔ s ł c n/, C_2 /k q ʔ s ł c/, C_3 /k q ʔ s ł x c n/, C_4 /t k q ʔ s ł x m n w y/. The appearance of both class I and II consonants in C_4 confirms our practice of assigning the last intervocalic consonant to the following syllable. The occurrence of /n/ in C_1 also indicates that C_1 belongs with the preceding syllable. C_2 has a membership resembling that of C_1- in C_1C_2C, though it adds /q ʔ/; but the three-consonant clusters which result if we divide VC.CCCV do not agree with those that occur in the onset (only 6 of 25 are also initial). On the other initial C_1; it adds /n ʔ/ and only the following clusters to those that occur initially: /ʔn xn ʔt ʔn ʔy sm cy ls n ʔ ʔł łx ʔk/. Of the possible alternatives for dividing -CCCC-, it would thus seem that the best is -CC.CC-, although this also adds a number of new clusters. These are, in the coda /pq kq qł sk sł sc łq łc cʔ nł nc/ and, in the onset /ʔn xn ʔt ʔy sm cy ls n ʔ ʔl łx ʔk/.

6.5. Five consonants. There are only 6 of these medials, and the memberships are: C_1 /ʔ s ł/, C_2 /s c/, C_3 /c k s/, C_4 /k x n c ł/, C_5 /l m ʔ q/. These memberships can be regarded as fragmentary correspondences to those of $-C_1$, $-C_2$, C_1-, C_2-, C-. The only exception is the occurrence of /n/ in a position remote from the vowel; but we have already seen this above, in the 4-consonant clusters, and it occurs only before /ʔ/. This requires a division into -CC.CCC-; not all the sequences have occurred before. The following are new: as coda /sc łc/, as onset /ck ʔ cn ʔ kcm/.

6.6. Diagram. The following diagram represents the interlude and its division into structural coda and onset:



This is to be read as follows: the last consonant in the interlude always goes with the following syllable; if there is only one preceding consonant, it goes with the preceding syllable, but if there are more, two go with the preceding syllable. A formula for the membership of the positions is: $-C_1-$ = C − h (before C_2 = C − hxlw); $-C_2-$ = C − hlwy; $-C_3-$ = kqʔsłxcn (before $-C_4-$ = ksc); $-C_4-$ = kxncł.

7. In the preceding paragraphs we have reinterpreted Garvin's data in terms of syllables, thereby permitting us to eliminate the contours as the immediate environment of the phonemes. Instead we may say that syllables occur in contours, either as initial (S-), medial (-S-), or final (-S), the hyphen in each case standing for the absence of juncture. Each syllable has a nucleus with two positions (CV) and a margin which may be either pre-nuclear (onset) or post-nuclear (coda). The maximum length of the margin is three consonants, which is reduced to two when the coda is immediately followed by the onset of a new syllable. In the following table all occurring two-phoneme sequences will be listed, with the letters i m f standing for initial (onset), medial (interlude), final (coda); if they occur only in three-phoneme or longer sequences, which have here been broken down by analysis, the letter is italicized. Consonants with m only are limited to the position next to the vowel. The phonemes have been listed by Garvin's class I and II; the NW quadrant shows the clusters that occur most freely, the SE quadrant those that occur least freely. The ambiguous status of /ʔ/ is obvious: it is sometimes voiced and sometimes unvoiced (finally and before vl. consonants). The cluster /nʔ/ occurs initially, but in free variation with /ʔ/. /h/ has been omitted; for details see Garvin.[5]

[5] In a letter of December 19, 1955, Garvin accepts the conclusions of this paper and adds the following confirmatory evidence: on a second field trip (1950) when he was able to use a tape recorder, he added a number of clusters to the list from his first field trip. Among these are /łc ckʔ cnʔ/, postulated as syllable-initial above, but now occurring also as contour-initial. A theoretical point made by Garvin is that operationally phoneme distribution has to be stated in terms of contours, since only contour boundaries are directly observable in the text; only after phoneme distribution has been stated within the contour can the distributional pattern be analyzed in such a way as to allow for syllable division.

C_2

C_1	p	t	k	q	s	ł	x	c	ʔ	m	n	l	w	y	
p		m	mf	m*f*	mf	m	m*f*	m	*m*	m	m	im		im	p
t	*m*		im*f*	m*f*	mf	m*f*	m	mf	imf	m	m	m	m	m	t
k	imf	imf	im*f*	im*f*	imf	im*f*	im	im*f*	imf	im	im	im	im	im	k
q		m*f*	im*f*		im*f*	m*f*	m	m*f*	imf	m	m		m		q
s	m	imf	im*f*	im*f*	*im*	im*f*	m	m*f*	m	m	im	m	im	*m*	s
ł	im	mf	im*f*	im*f*	*imf*	im	*imf*	*imf*	im	*im*	m*f*		*im*		ł
x		m					m			im	*im*		m		x
c		im	im*f*	im*f*	im	im	*im*	m	im*f*	im	*im*		m	*im*	c
ʔ	*mf*	*imf*	*imf*	m	mf	*imf*	m	*m*		*imf*	*imf*		m	*im*	ʔ
m		m	m		mf	m	m	*m*	m	m	m		m		m
n		m	m*f*	m*f*	mf	m*f*	m*f*	m*f*	*im*	m	m			m	n
l												m			l
w					mf	m	m						m	m	w
y		m	mf	m*f*	mf	m	m	m		m	m		m		y
	p	t	k	q	s	ł	x	c	ʔ	m	n	l	w	y	

TABLE 7

CENTRAL ALGONQUIAN /t/ AND /c/

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1. Contemporary descriptive data
2. Statistics
3. Bloomfield's PCA reconstruction
4. PCA distribution
5. PCA external sandhi habits and their bearing on the problem
6. Conclusion

1. In all the Central Algonquian dialects on which we have reliable information—F(ox), C(ree), M(enomini), O(jibwa), P(otawatomi), and Sh(awnee)—there is a phonemic contrast between an unaffricated apical stop /t/ and an apical or laminal affricate /c/. The affricate is laminal, with hushing offglide, in those languages (F, O, P) which distinguish two spirants /s/ and /š/, as well as in Sh and the Kickapoo dialect of F, which have /θ/ in place of F, O, P /s/. It is apical, with hissing offglide, or varies between apical and laminal, in C and M, where there is but one tongue-front spirant /s/, which shows just the same non-distinctive range of variation in articulatory position.

We illustrate the contrast for F, C, M, and O, the four languages which will concern us most in the sequel:

In F: initial /taka·wi/ *a little*:/caca·tapi/ *regularly*; medial /nekoti/ *one*:/kesici/ *thy foot*.

In C: initial /te·hci/ *on top*:/ce·skwa/ *wait a bit*, /tahkatam/ *he jabs it*:/cahkatahwe·w/ *he prods him with stick or beak*; final /niska·t/ *my leg*:/oskac/ *at first*.

In M (using the letter 'q' for glottal catch): /teya·weqtaw/ *he has free time*: /ceya·w/ *perforce*; /neti·h/ *my legging*: /neci·qtan/ *my sinew*; /ne·pet/ *my tooth*: /apec/ *exactly*.

In O: /ta·ppene·/ *he drowns*:/ca·ca·mo/ *he sneezes*; /a·nint/ *a few*:/neninc/ *my hand*.[1]

Our examples demonstrate the relevant contrast in each of the four languages, but do not in themselves prove that /c/ requires to be interpreted as a unit phoneme rather than as a cluster. Although this is a moot point descriptively, it is not germane to the present discussion and the arguments pro and con will be omitted.[2]

2. The strength of the contrast between /t/ and /c/ varies from language to language.

In F it is only thinly maintained: /c/ is far commoner than /t/ before the high front vowels /i/ and /i·/, and /t/ far commoner than /c/ before all other vowels (neither occurs before a consonant, not even before /y/; and none of the F consonants occur finally).

In M the situation is only in part similar. Table I shows figures for the occurrence of initial /t/ and /c/ before various vowels and diphthongs in the entries in Bloomfield's unpublished M Lexicon. The figures are thus list-frequencies, not text-frequencies, which in the case of M are exceedingly difficult to obtain.[3] The last column on the table shows,

[1] The long vowels of O are /i· e· a· o·/, and the short vowels are /i a o/. In certain rhythmic positions in the word, it is possible to hear only the distinction between roundedness and its absence for short vowels; for these overshort alternants of the short vowels Bloomfield writes /u/ and /e/. We follow his usage here. The exact phonemic status of /u e/ is not clear. Bloomfield's Eastern Ojibwa, due for publication shortly, will supply the interested reader with fuller details.

[2] The phonological status of F /c/ is taken as paradigmatic in several methodological passages of the writer's Manual of Phonology (IUPAL Memoir 11, 1955): §§262, 3231.

[3] In his published Menomini Texts (AES Publications 12, 1928), Bloomfield fails to record all the phonemically relevant distinctions in the high front range for short vowels (as he himself notes on p. xiv). In order to make a text-frequency

for each following vocalic environment, what proportion of the total occurrences of /t/ or of /c/ are in fact occurrences of /t/. The corresponding relative frequency for /c/ can be obtained by subtracting the listed figure from unity. It will be noticed that /t/ is absolutely more frequent than /c/. Beyond this, it should be noted that /t/ is commoner than /c/ before all vowels and diphthongs save only /i·/, /ia/, and /e·/, where /c/ prevails. The degree of prevalence is striking: the proportions given in the last column are all either greater than .75 or less than .10.[4] We cannot merely say, as for F, that /c/ is the commoner before 'high front vowels'; structurally the short /e/ is just as high and front as the long /e·/, and phonetically it is commonly even higher, yet before it /t/ rather than /c/ predominates.

TABLE I

List-frequencies of Menomini initial /t-/ and /c-/ before the various Menomini vowels and diphthongs

Before:	/t-/	/c-/	/t-/ or /c-/	Rel. freq. of /t-/
/i·/	4	44	48	.0833
/i/	0	0	0	—
/ia/	0	7	7	.0000
/e·/	1	73	74	.0135
/e/	75	6	81	.9259
/ɛ·/	64	0	64	1.0000
/ɛ/	4	0	0	1.0000
/a·/	21	3	24	.8750
/a/	169	3	172	.9825
/o·/	20	3	23	.8652
/o/	3	0	3	1.0000
/u·/	7	2	9	.7778
/u/	0	0	0	—
/ua/	2	0	2	1.0000
Totals	370	141	511	.7241

TABLE II

List-frequencies of Cree initial /t-/ and /c-/ before the various vowels and /w/

Before:	/t-/	/c-/	/t-/ or /c-/	Rel. freq. of /t/
/i·/	0	87	87	.0000
/i/	69	32	101	.6832
/e·/	48	5	53	.9057
/a·/	110	8	118	.9322
/a/	154	26	180	.8556
/o·/	31	6	37	.8378
/o/	1	0	1	1.0000
/w/	6	0	6	1.0000
Totals	419	164	583	.7187

In C, list-frequencies and text-frequencies support each other fairly well. Table II gives list-frequencies of /t/ and /c/ as word-initial phoneme before the various vowels and /w/, from the entries in Bloomfield's unpublished C Lexicon. Table III is similarly constructed, covering all occurrences in a 41-line passage of running text of /t/ and /c/. We observe, first, that /t/ is of markedly higher frequency; and, second, that /c/ predominates over /t/ only before /i·/. The predominances of one or the other are sharp except before /i/, where the figures (.6832

count it would first be necessary laboriously to retranscribe a passage of text, checking each word in it against Bloomfield's unpublished Lexicon and Grammar. This is a perfectly feasible procedure, but I am not convinced that the yield would justify the effort.

[4] The functional load carried by a given contrast in a given environment is greatest if the two contrasting items have equal text frequencies, and least—that is, zero—if one of the two items occurs in that environment to the exclusion of the other. Given the frequency figures in the form of proportions which sum to unity for the relevant environment, the functional load can be quantified as follows. Let p be the proportion of occurrences of one item, and let $q = 1 - p$ be the proportion of occurrences of the other. Then

$$-p \log_2 p - q \log_2 q$$

will always be a positive number between 0 and 1. For $p = q = .5000$, the function equals 1; for either p or $q = 1.0000$, the function equals 0. The values of the functional-load measure for some of the proportions in the last column of Table I are: before /i·/: .41371; before /e·/: .10319; before /e/: .38104. Note that these figures—if based on sufficiently thorough counts, not on the very rough ones shown in our tables—are of value only in comparing the relative functional loads of one and the same contrast in different environments; they say nothing about the relative importance of one contrast vis-à-vis the other contrasts in the same phonologic system.

TABLE III

Text-frequencies of Cree /t/ and /c/ (all environments, not just initially), in terms of what follows

Before:	/t/	/c/	/t/ or /c/	Rel. freq. of /t/
/i·/	1	5	6	.1667
/i/	14	8	22	.6364
/e·/	19	0	19	1.0000
/a·/	15	2	17	.8824
/a/	48	1	49	.9796
/o·/	4	0	4	1.0000
/o/	8	0	8	1.0000
/w/	4	0	4	1.0000
final	20	3	23	.8696
Totals	130	19	149	.8725

and .6364 respectively) indicate something more nearly approaching even distribution.

Another factor is relevant in C. There is an apparently recent alternation between /t/ and /c/, at least in Plains C: in the formation of diminutives an ending containing /s/ is added to the underlying stem; in addition, most speakers replace a /t/ anywhere earlier in the word by /c/. This habit is carried over also to some non-diminutive forms with an /s/ near the end of the word. Thus /ata·hk/ *star* is not now used as commonly as what is formally, and in origin, a diminutive /aca·hkos/; from both of these nouns there are derived verbs of being, /ata·hko·wiw/ and /aca·hkosiwiw/ *he is a star*. This alternation serves to set up many more occurrences of /c/ than would otherwise occur. But where, as among some younger speakers, it is carried to its logical conclusion, so that /t/ simply does not occur anywhere in a word before a later prevocalic or final /s/, the functional load carried by the /t/:/c/ contrast is lessened rather than increased. A good many words of otherwise unitary shape come to have two forms; e.g. /a·tisin/ or /a·cisin/ *he is blocked*.

Regrettably, at this writing I do not have any comparable figures to present for O. Without making a count, it would seem reasonable to suppose that in O, as in C, the contrast between /t/ and /c/ would be strongest before /i/.

3. A standard working principle in comparative linguistics is to assign to the common parent any feature shared by all the descendants. Accordingly, in reconstructing the sound system of PCA, Bloomfield set up both a */t/ and a */c/: the former wherever F, C, M, and O all show /t/, the latter wherever they all show /c/. Thus */t/ is posited as the third consonant in */pema·tesiwa/ *he lives*, given F /pema·tesiwa/, C /pima·tisiw/, M /pema·tesew/, O /pema·tesi/; */c/ is assumed in */pema·cihe·wa/ *he makes him live, restores him to life*, on the basis of C /pima·cihe·w/, M /pema·cehew/, O /pema·ceqa·t/ (with a different inflectional ending; the F form is not recorded, but would doubtless be */pema·cihe·wa/).

In some instances the languages superficially disagree as to /t/ or /c/, but the principal morphophonemic basis for this disagreement is known and it makes little trouble. Thus *my foot* is F /nesici/, with /c/, whereas C has /nisit/ with /t/. The F plural *my feet* is /nesitani/: morphophonemically basic /t/ in F is replaced by /c/ before following /i/, /i·/, or /y/. This alternation lives, in one form or another, in all the daughter languages, and can be presumed to be of PCA age. The final /t/ of the C form is an analogical reshaping of the singular, after the loss in pre-C of the word-final /-i/, on the basis of the shape appropriate to occurrence before other inflectional endings.

The guiding principle for reconstruction stated at the beginning of this section is not an overriding one: it requires explication, and with each possible explication must be subject to a variety of checks. To begin with, what do we mean by ' "feature" shared by all the descendants'? What is a 'feature'? One possible answer—there are others, also of importance—is that a 'feature' may be a phone: a simultaneous bundle of articulatorily describable motions, functional at one end-point of each of one or more dimensions of opposition in the phonological system. This sesquipedalianistic description must

be interpreted freely enough to allow the case of phones which are not functionally in contrast with each other, providing that they can be accurately described in terms of dimensions of opposition which do function contrastively in other combinations. A hypothetical example will help—I hope: language Q has [p t k b d g], with clear contrast for all pairs except [k] and [g]; the phonemes are then only five in number, but [k] and [g] are separable as phones because the phonetic difference between them functions phonemically in the context of bilabial or of apical position of articulation.

This means, for the problem at hand, that Bloomfield's reconstructed apical consonants must in the first instance be represented as *[t] and *[c]. We follow the phonetic and componential evidence in reconstructing both for PCA; the precise phonemic status of the two reconstructed phones cannot be ascertained without careful distributional survey.

4. The first results of a distributional survey are startling. Bloomfield reconstructs 404 PCA forms (usually whole words, occasionally stems) in his comprehensive treatment of Central Algonquian.[5] In this wide range, *[t] and *[c] are in complete complementation. The former never occurs before PCA */i/, */i·/, or */y/; the latter occurs only before one of those three.[6] There is no other instance of such complementation among his reconstructed consonants—not even between */θ/ and */š/, where, as we shall see in a moment, it might also reasonably be expected.

[5] Algonquian; LSNA (VFPA 6, 1946) pp. 85–129.

[6] Bloomfield also writes 'c' (his symbol bears a wedge, here omitted) as first constituent in consonant clusters. The phonemic status of these first constituents is an exceedingly complex problem in itself, and many of Bloomfield's choices of symbols for them are admittedly arbitrary rather than realistic. In any case, there is not even a graphic contrast with 't' in this position, since the latter letter is not among those selected by Bloomfield for this particular range of use.

We have already mentioned the F alternation between /t/ and /c/ which appears also in the other daughter languages. Bloomfield calls this alternation 'mutation.' For PCA he describes it approximately as follows: before */i/, */i·/, and */y/, morpheme-final *[t] is replaced by *[c], and morpheme-final */θ/ by */š/. This habit accounts for the non-occurrence of PCA morpheme-final *[t] and */θ/ before the high front vowels and semivowel; it just also so happens that there are no occurrences (in the 404 reconstructed forms) of non-morpheme-final *[t] or */θ/ before a high front vowel or semivowel. Further, there are no occurrences of *[c], in morpheme-final or elsewhere, other than before a high front vowel or semivowel; but there are, indeed, some occurrences of */š/ in other environments—eight of */še/, one each of */šo· še· ša šo/, and six of */šw/. There is no realistic way of explaining away this wider distribution of */š/: */θ/ and */š/ must be accepted, as Bloomfield implied, as distinct phonemes.

For *[t] and *[c], on the other hand, it is tempting to reinterpret the evidence by setting up a single apical stop phoneme */t/, having allophones *[t] and *[c] with the distributions already stated. The alternation of mutation would then be morphophonemic for the spirants */θ/ and */š/, but subphonemic for */t/. With this as the PCA point of departure, the post-PCA phonologization of the stop-affricate contrast could be realistically accounted for along the following lines:

(1) In all the languages but F and Sh, the characteristic final short vowel of PCA words is in most instances lost. Wherever this is the first relevant development, pre-loss *[ci] and *[te ta to] yield, respectively, post-loss */c/ and */t/: our switch to slant lines indicates the post-loss phonemic status of the difference. Later, individual forms may be analogically reshaped (e.g., C /nisit/ *my foot* with final /t/ instead of /c/), without destroying the newly acquired phonemic contrast.

(2) In C and O, PCA *∕i∕ and *∕e∕ fall together, when not lost; in P there is the three-way coalescence of *∕i∕, *∕e∕, and *∕a∕. In C and O the result is /i/, in P, /ə/. Thus pre-coalescent *[ci] and *[te] yield, respectively, post-coalescent *∕ci∕ and *∕ti∕, still surviving in C and O; in P *[ci] yields /cə/ in contrast with /tə/ from *[te] and *[ta].

(3) In F, PCA postconsonantal *∕wi∕ yields /i/, falling together with /i/ from PCA *∕i∕. Thus pre-coalescent *[twi] becomes /ti/, but pre-coalescent *[ci] becomes /ci/. In M the reorganization of interconsonantal sequences of semivowels and vowels is more complex, but leads to comparable results for the status of preceding consonant phones.

A few more contributing environmental changes could be added to the above list, or developed from it by expansion: for example, in F, PCA *∕y∕ is lost after *[c] and *∕š∕, setting up the stop-affricate contrast in such cases as /ta·/:/ca·/.

5. There is one convincing reason why the proposed change in our view of PCA phonological habits must be considered with caution, and in the end, I believe, rejected in favor of a slightly different reinterpretation. Bloomfield's 404 reconstructions are of forms never longer than a single word (in typical and proper neo-grammarian conservatism), and set each word up in the phonemic shape it would presumably have had when spoken in isolation. We must try to guess what external sandhi alternations would have been operative in normal flowing speech. Only after making our best guess about this can we in part replace a strict word-phonological (Wortphonologisch) understanding by one which accords more with modern trends in phonemic theory.

In PCA all words ended, in isolation, with a short vowel. This habit is retained only in F and, with some obscure modification, in Sh. In C, M, O, and P, the final short vowel in most cases has been lost. We may therefore suspect that the external sandhi habits of F and Sh will shed more light on such habits in PCA than will those of the other daughter languages.

In F, words in a phrase follow each other without any phonemic open juncture, and with some modification of phonemic shape to conform to internally permitted sequences of vowels and consonants. Before a word-initial vowel, short or long, the final short vowel of the preceding word drops in most cases; occasionally the unpermitted sequence of two vowels is obviated instead by the insertion of /h/.

In Sh, also, words in a phrase follow each other without phonemic open juncture; a word-final vowel is often lost before a word-initial vowel, with what might be described as 'compensatory lengthening'; but certain vowel-sequences seem to be permitted under these conditions (e.g., /ai/) which do not otherwise occur without an intervening open juncture of the inter-phrase type.

In both F and Sh, in the most frequent type of sentence ending with the most frequent and colorless intonation, the final short vowel of the last word, and often a preceding voiced consonant, are devoiced.

In both F and Sh, if the consonant before the last vowel of a word is /c/, mutated from basic /t/ by vowel /i/, then the loss by external sandhi of the terminal /i/ does not 'unmutate' the /c/ back to /t/—the speaker produces /c/ as though the /i/ were still there, and then goes on to the initial vowel of the next word without producing the /i/.

The external sandhi habits that can most realistically be ascribed to PCA are those shared by F and Sh: loss of the final short vowel of a word when followed within the phrase by a word beginning in a vowel, and devoicing of phrase-final short vowel. The current state of affairs in the other daughter languages is consonant with this hypothesis, since such an external-sandhi set-up is obviously a natural point of departure for the eventual complete loss of most word-final short vowels. Phrase-final whispering could

grow into phrase-final omission; the shapes of words without final short vowels then occur in two environments instead of one (final as well as prevocalic), and analogy can run its course.

Now if we assume this situation for PCA, then it probably follows that PCA *[t] and *[c] would already have been in contrast in one position: as the consonant before the last vowel of the basic form of a word, when that word is followed in the same phrase by one beginning in a vowel. Thus */pya·te/ *if he comes* and */pya·ci/ *he who comes*; *that he came* might each be so followed by such a noun as */elenyiwa/ *man*, and with the postulated sandhi habits this would lead to */pya·telenyiwa/ versus */pya·celenyiwa/, contrasting *[t] and *[c] before */e/. The same would happen before all the other vowels of PCA save only */i/, which is assumed never to have occurred in the first syllable of PCA words, whether or not preceded by a consonant.

6. Our conclusion, then, is not simply a reduction of the inventory of PCA consonantal phonemes by one item; rather, it is a diachronic induction involving pre-PCA stages, PCA, and the separate continua down to the current daughter languages:

(1) There was probably a pre-PCA stage of development in which a single phoneme */t/ had allophones *[t] and *[c], the latter occurring only before high front vowels and semivowels. At this same stage, probably the phoneme */θ/ (a partly arbitrary symbol) had two comparable allophones, *[θ_1] with the distribution of *[t], and *[θ_2] with the distribution of *[c].

(2) By PCA as directly reconstructable by the comparative method, */t/ and */c/ have been thrown minimally into contrast, but only across word-boundary, through the development of the external sandhi habits outlined above. There may, of course, have been fluctuation in usage, or dialect differences (some speakers not even having the contrast in this one set of circumstances, others having it there), but such details cannot be recovered. Also by PCA times, the allophone *[θ_2] has fallen together phonetically with */š/, so that */θ/ (in the phonetic shape *[θ_1], whatever that was) and */š/ are in contrast save before high front vowels, where only the latter occurs. With these two changes in the system, mutation has become a morphophonemic habit instead of a subphonemic one.

(3) Ensuing developments in the daughter languages, as outlined in **4**, then serve not to phonologize the */t/:*/c/ contrast, but only to increase the functional load carried by it.

SOME POST-CONQUEST CHANGES IN MAZAHUA

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0. Introduction
1. Phonemes
2. Verb proclitics
3. Lexical change
4. Summary

0. The oldest known study of the Mazahua language was made by Diego de Nagera Yanguas in his Doctrina y Enseñanza en la Lengua Mazahua, published in 1637.[1]

It is my purpose to indicate some similarities and differences in the Mazahua of today and that spoken 300 years ago. The Mazahua spoken today was recorded[2] in the region of Santa María Citendejé and San Miguel Tenoxtitlán in the Municipio of Jocotitlán, Estado de México. Diego de Nagera Yanguas was a native of Mexico and a resident of Jocotitlán[3] and had worked among the Mazahuas for more than 43 years.[4] Possibly he was a native speaker of Mazahua. It is assumed that his data were gathered in the region of which he was a resident.[5]

1. It has been stated by Jacques Soustelle that there has been no extensive change in the phonetic system of Mazahua in three centuries.[6] Nagera Yanguas makes essentially the same number of vowel contrasts as we have today. Today there are nine oral vowel phonemes: /i, e, ɛ, a, ɔ, o ,u, ə, ʌ/. In DE we find i, e, a, o, u occurring in the following words: guinbeñi /gi nbeñi/ *te acuerdas* (14a)[7] /gi mbeñe/; yehe /yehe/ *dos* (33a); daha /daha/ *una* (33a); amboo /ambo$^{?}$o/ *dentro* (35b); reñuhi /re ñuhi/ *a ver* (51a) /ri ñuhi/. In the examples given it will be noted that there has been a shifting of the vowels /i/ and /e/ since three centuries ago. We will note later that a more extensive shift has taken place in the back vowels. In DE /ɛ/ is sometimes symbolized by è (extechènhi /ešte čɛnhi/ *llevad luego* [78b] /ešti čhɛnhi/) and sometimes by æ (hæ /hɛ/[8] *pena* [155a]). At times /ɛ/ seems also to be symbolized by ę (nahę /na hɛ/ *padeció* [176a]), and by e when the vowel is phonetically a little higher (pehpi /pɛhpi/ *trabajo* [107a]). /ɔ/ is symbolized by ho: tthogue /t$^{?}$ɔgʌ/ *sepultado* (82b) /t$^{?}$ɔgə/; bhobue /bɔbʌ/ *levantar* (98a) /bɔbə/; xhore /šɔre/ *aprender* (101b) /šɔrə/; ñhone /ñɔne/ *comer* (100a) /ñɔnə/. /ə/ is symbolized by ui after bilabials (buibui /bəbə/ *estuvo* [132a]; muibui /məbə/ *corazon* [148b] /mə$^{?}$bə/) and by hi after š (xhitti /šəthi/ *espalda* [103a] /šəthə/). After ñ /ə/ is

[1] Hereinafter referred to as DE. It was reprinted in 1952 and 1953 by "Biblioteca Mexicana de Obras Raras y Curiosas". Pimentel makes his analysis of Mazahua from the data in this book. D. Francisco Pimentel, Obras Completas 2.394-399 (México, 1903).

[2] These data were gathered under the auspices of the Summer Institute of Linguistics during the years 1939 to 1954.

[3] DE, Prologo.

[4] DE, page "Al Lector".

[5] Though geographically not very far apart, the villages of Santa María Citendejé, San Miguel Tenoxtitlán, and those surrounding Jocotitlán today have minor differences in dialect.

[6] "Alors que le système phonétique de l'otomi s'est profondément modifié entre le XVII^{e} siècle el l'époque actuelle, celui du mazahua ne semble pas avoir évolué sensiblement dans le meme laps de temps." Jacques Soustelle, La Famille Otomi-Pame du Mexique Central, p. 293 (Paris, 1937).

[7] Citations are indexed by the number of the leaf. The writing in slant lines when occurring juxtaposed to the DE form is my phonemicization of Nagera Yanguas material. When the slant lines follow the page number it is my phonemicization of modern Mazahua. Where the forms differ and where pertinent, both forms are given. Forms from DE are given with Nagera Yanguas' Spanish glosses.

[8] Probably related to modern /sɛ́ži/ *to suffer*.

symbolized by ũ and ù: ñũ (144a); ñù (175a) *madre* /ñə/. /ʌ/ is symbolized by ue after the bilabial m (anzumue /anzumʌ/ *casa* [84b] /anzumə/) and by he after other consonants (xhene /šʌne/ *cántaro* [100a] /šʌhnʌ/; nezoqhe /ne sʔokʌ/ *pecado* [14b] /ne sʔohkə/). In the examples tʔəgʌ, bəbʌ, and anzumʌ the final vowel has probably undergone a change from /ʌ/ to /ə/. In some idiolects today the vowel /ʌ/ still occurs more frequently than the vowel /ə/.

It is difficult to determine how many nasalized vowels there were three centuries ago. Today there are six: /į, ę, ą, ǫ, ų, ę̨/. Nagera Yanguas' transcription does not regularly mark nasalized vowels. However, they seem to be sometimes symbolized by vowel symbol plus n as in tenxi /tęši/ *todas* (88a) /tęšę/; and at times by Vj as in ihij /ihį/ *dormir* (87a) /įhį/. The rarely used circumflex over a vowel symbol in DE seems also to indicate a nasalized vowel: nehuêtzentte /ne hwętsʔe nte/ *esta merced* (169a); xômue /šǫmʌ/ *noche* (89b) /šǫmə/. It is not clear whether the symbol â actually marks nasalized /ą/ or not.

The pattern of vowel assimilation in Mazahua[9] appears to have undergone change in the stem formative morpheme since the time of Nagera Yanguas. Then as now, the vowel of the stem formative was predictable in terms of the vowel of the root morpheme. In the Mazahua spoken today the vowel of the stem formative is still predictable but is a different one.

In DE, vowels which we phonemicize as /i, e, ə/ were followed by the same vowel in the stem formative. But if the stem formative began with a consonant other than a bilabial, /ə/ was followed by /i/: mimi /mimi/ *estas* (86b); ñehe /ñehe/ *también* (82b); muibui /məbə/ *alma* (106b) /məʔbə/; puiri /pəri/ *empezar* (41a) /phərə/. Vowels /a, o, ɔ, u, ʌ/ were followed by /e/ in the stem formative unless the stem formative began with a bilabial, in which case /ʌ/ occurred: phare /phare/ *caballo* (103a) /phadə/; otte /otʔe/ *primero* (ꞌɔ6a) /otʔə/; xhore /šɔre/ *aprender* (101b) /šɔrə/; vne /une/ *doy* (167b) /unə/; puere /pʌre/ *quebrar* (100a) /pʌrʌ/; pamue /pamʌ/ *cada día* (121b) /pamə/; obue /obʌ/ *dormir* (81a) /obə/; bhobue /bəbʌ/ *levantar* (98a) /bəbə/; ninzumue /ni nzumʌ/ *su casa* (39b) /ꞌi nzumə/; puemue /pʌmʌ/ *vuelvo* (106b) /pəmə/. The occurrence of root vowel /ɛ/ in DE is unclear.

In modern Mazahua vowels /i, e, ə, ʌ/ in the root are followed by the same vowel in the stem formative regardless of the initial consonant of the suffix: /mími/ *to be*, /ñéhe/ *and*, /sə̂rə/ *to catch*, /sáhʌ/ *to arrive*. Stem vowel /ɛ/ is followed by /i/: /hɛzi/ *to permit*. Back vowels /a, o, ɔ, u/ are followed by /ə/ (or /ʌ/ in the speech of some individuals) unless the stem formative begins with /ʔ/ or /h/, in which case they are followed by the same vowel: /phâdə/ *horse*, /ôtʔə/ *primero*, /šɔ̂rə/ *to read*, /nà púnkhə/ *many*, /pâʔa/ *day*, /tʔòʔo/ *hole*, /ɔ́ʔə/ *flea*, /mùʔu/ *squash*.

In modern Mazahua there are 23 consonant phonemes: /p, t, c, č, s, k, kʷ, ʔ, b, d, g, gʷ, š, z, ž, h, m, n, ñ, w, y, r, l/.[10] With the exception of /s/ and /l/ these same phonemes occurred in the Mazahua of three centuries ago. /p, t, c, č, k, kʷ, b, d, g, gʷ, š, z, h, m, n, ñ, w, y, r/ occur in the following words in DE: paxi /paši/ *barre* (77a); tenxi /tęxi/ *todos* (51a); mi çhoo /mi choʔo/ *mi cuñado* (34b); michoo /mi čoʔo/ *mi suegra* (34b); oqhi /o khi/ *sangre* (67a); haqhua /ha kʷha/ *adonde* (125a); behpa /bepha/ *adelante* (24b); daha /daha/ *una* (33a); guiza nonguee /gi za no ngeʔe/ *comiste carne* (30a); unguaro /u ngʷaro/ *está hecha* (84b); xihpi /šiphi/ *di* (15a); razere /ra zere/ *se han de encender* (67b); hi /hi/ *no* (12a); tamimi /ta mimi/ *sea* (83a); nahoga /na ho ga/ *muy* (84a); teñuhi /te ñuhi/ *mirad* (77b); huechi /hweči/ *apagar*

[9] Hazel Spotts, Vowel Harmony and Consonant Sequences in Mazahua (Otomí). IJAL 19.253-258 (1953).

[10] Ibid.

(61b); yehe /yehe/ *dos* (33a); hiripare /hi ri pare/ *no conozco* (23b).

/ʔ/ is not symbolized in DE but doubtless occurred between vowels written as geminate clusters: amboo /amboʔo/ *dentro* (165b). Today there are no clusters of identical vowels without /ʔ/ or /h/ separating them.

According to Newman and Weitlaner the Proto-Mazahua phoneme /ž/ is a special development in Mazahua.[11] This phoneme had apparently already developed early in the seventeenth century. In DE, x was used to symbolize both /š/ and /ž/; tenxi /tęxi/ *todo* (170a) /tęšę/; robexi /ro beži/ *perdí* (88a) /ró béži/. If x did not here represent /ž/ we would expect to find dy since /ž/ is a palatalized form of Primitive Central Otomian /d/.[12] In modern Mazahua /ž/ occurs only in the stem formative syllable following a front vowel in the root. /d/ never occurs in this position.

The modern Mazahua phoneme /s/ appears to have developed from colonial Mazahua ç [ts]: mi çu /mi cu/ *tuve miedo* (14b) /mí sú/; ça /ca/ *comer* (9a) /sa/. Such development ties in with what we know about Otomí.[13] DE (1a) rejects s as a symbol. The only feasible interpretation of the symbol ç seems to be that it represents the phoneme /c/. In at least one instance the /c/ of colonial Mazahua remains /c/ today: çhee /cheʔe/ *vergüenza* (14b) /chêhe/. In most other cases the modern phoneme /c/ corresponds to a palatalized form of /k/ as it did three centuries ago. These palatalized forms occur in certain verb stems in the second person: rocha /ro kha/[14] *he hecho* (24b) /ró khá/; re ça /re cha/ *hagas* (15a) /rí čhá/.

[11] Stanley Newman and Robert Weitlaner, Central Otomian II: Primitive Central Otomian Reconstructions. IJAL 16.73-81 (1950).

[12] Ibid.

[13] In many roots the modern Mazahua phoneme /s/ corresponds to the modern Otomí phoneme /c/.

[14] ch appears to have been used at times to symbolize /č/ and at times to symbolize /kh/.

The symbol z appears to have been used for both /cʔ/ and /z/ in DE. Probably the /sʔ/ of today developed from the /cʔ/ of three centuries ago: yhazi /hyacʔi/ *amanecer* (85b) /hyasʔə/; ttezi /tʰezi/ *campana* (86b) /tʰɛzi/.

The modern phoneme /l/ has developed from Spanish borrowings as /lobo/ (from *globo*) and possibly from baby talk as /lɛlɛ/ *baby* (from /wɛ/ *to cry*).

The sequences of consonant plus aspiration or glottalization were variously symbolized. Aspirated sequences were usually symbolized with an h following the consonant: phare /phare/ *caballo* (103a) /phadə/; noqhua /no kʷha/ *conejo* (41b) /kʷha/. At times in DE a sequence of h plus consonant occurs where one would expect consonant plus h. Perhaps the wrong form of the word was used: pehpi *trabajo* (107a); compare modern /pɛ̂hpi/ *to work for someone*, /pêphi/ *to work*. Double consonants usually were used to indicate a glottalized sequence, though sometimes they indicated an aspirated sequence and sometimes even an unaspirated consonant: nabhottentte /na bɔtʔente/ *mortal* (139a) /nà bɔ́tʔənte/; batte /bathe/ *valle* (177a) /bâthə/.

2. The verb proclitics have undergone more noticeable change than any other phase of the language. Nagera Yanguas (2, 3) gives three tenses commonly in use:

	Present		Past		Future	
	DE	Modern	DE	Modern	DE	Modern
1st	ti	rí	to	ró	ta	rá
2nd	ki	ʔí, ʔín, gi	gi	ʔí, ʔín	te	rí
3rd	y	lacking in modern	po	ʔó	ta	rà

The vowels have remained the same with the exception of the second person future form, where /e/ has been replaced by /i/. The third person present proclitic has been lost. The stops /p, k, g/ have been replaced by /ʔ/; /t/ by /r/. There are indications

that even in the seventeenth century this change was taking place. Proclitics beginning with /t/ were inconsistently written with /r/: rayhetzi and tayhetzi *dejar* both are recorded on page 124a. Perhaps this alveolar sound was a retroflexed one. In some idiolects /t/ and /d/ are retroflexed in modern Mazahua.

Nagera Yanguas (2b) states that the only way to distinguish between first and third persons future is to add the suffix -go to the first person. In modern speech first and third persons future are distinguished by tone; /-gɔ/ merely adds emphasis to the first person. Probably the same distinction existed in the seventeenth century.

Soustelle says that Mazahua has lost much of its system of verb prefixes and that there are now many homophonous forms.[15] Though there has been some change in the verb proclitics since three centuries ago, there is not much ambiguity found in the verb forms. Sometimes tone indicates the difference in tense or person or aspect: /ró má$^{\text{ʔ}}$a/ *I went*:/rò má$^{\text{ʔ}}$a/ *I would have gone*. Neither Nagera Yanguas nor Soustelle write tone in their data. Not only tone but also stem changes indicate differences in person, tense and aspect: /rá má/ *I go*: /rí pá/ *I go* (habitually); /rí khá/ *I make*: /rí chá/ *you will make*; /ín khá/ *you make* (habitually):/ín chá/ *you made*.

3. There are two classes of lexical change, neither of which is very extensive. They are (a) those words whose areas of meaning have changed and (b) those words which seem to be no longer in use or very little in use.

In class (a) we note the following words: ene *gallina* (94b) = modern *turkey*; yxi *naranjas* (95a) = modern *apples*; muêxa *gallo* (94b) = modern *male turkey*; nzo *fiesta* (17b) = modern *week*; ñechi *patli* (*narcotic herb*) (26b) = modern *medicine*; cho *hongo* (*mushroom used for medicinal and divining purposes*) (27b-29a) = modern /khòho/ *any edible mushroom*.

In class (b) we note the following: yo *vida* (51a); zaqhe *salud* (83b); ñemi *mano derecha* (82b) (modern /hó$^{\text{ʔ}}$yɛ/); bechi *tortilla* (42a) (modern /ɓɛ̂$^{\text{ʔ}}$yi/); ondee *hombre* (25b) (modern /bèzo/); xhimi *amigo* (138b) (modern /hówi/); endumuibui *tristeza* (87b) (from *die* plus *heart*); huaphare *buey* (89b) (from *field* plus *horse*); mintti *hermano* (89b) (from *together with* plus *son*); puette *imagen* (86a) (from *in place of* plus *person*).

There is an overlapping of classes: ñü *madre* (144a) /ñə̀/ is still used in some villages, but in others is used only when referring to animals; zizi *tía* (34a, b) used in San Lorenzo Tlacotepec as a term of respect when greeting a woman.

4. Post-conquest changes in Mazahua are relatively trivial. The vowel assimilation has undergone a slight change in that back vowels more frequently occur in the stem formative morpheme in present day Mazahua. Two consonants /s/ and /l/ developed during this period. An additional consonant /ž/ was developed prior to this time.

The changes in the verbs, though more noticeable than other changes, are nevertheless more trivial than implied by Soustelle. The greatest change is seen in the proclitics. where the consonant phonemes /p, k, g/ are replaced by /$^{\text{ʔ}}$, t, k/. However, a number of homophonous forms have not been developed as stated by Soustelle. Tone which distinguishes many of these forms was not indicated either in Soustelle's data or in DE.

Lexical change in the post-conquest period is also trivial. A few words have become obsolete and others have changed in area of meaning.

[15] Op. cit., 295.

NOTES AND REVIEWS

Three Disturbing Questions Concerning Lexicostatistics

Sarah C. Gudschinsky

I have indicated elsewhere that, in my opinion, the techniques of lexicostatistics yield interesting and useful results when handled with care.[1] I am seriously disturbed, however, by recent developments originating with the author of the lexicostatistical method, which seem to me to endanger the usefulness of the entire method through drastic reduction of the statistical base, coupled with exaggerated claims as to its validity and precision. The following queries are raised with the hope that they will stimulate careful answers which will in turn both develop the field and prevent the loss of ground already gained.

1. In elaborating the statistical validity of the techniques of lexicostatistics, Lees[2] assumed that the test list of 215 items which he used was a small sample of a 'basic-root-morpheme-inventory' of 'several thousand items.' This basic inventory was assumed to include 'cultural universals'—i.e. morphemes associated with meanings likely to be found in all cultures, such as body parts, numerals, geographical terms, and simple activities. Swadesh,[3] in a recent revision of the test list, reduced the number of items on the list from 200 to 100, and implied that these are almost all of the available items of the basic vocabulary. The list was reduced by eliminating items which had proved to be: not universal (e.g. ice, snow); cultural rather than basic in some instances (e.g. numerals, salt); relatively unstable in some languages (e.g. cut, pull, dig); potentially repetitions of other items on the list (e.g. wife and woman, fog and cloud); sound imitations (e.g. blow, laugh, cry); closely bound up with peculiarities of morphology (e.g. at, in, because).

Query: If only 100 items can be postulated as clearly members of the basic root morpheme inventory, is it probable that even these will prove to be in any real sense universal? That is, if fully half of the items of the original list proved to be unusable because of non-universality, cultural usage, instability, or other reason, is it reasonable to suppose that any one of the remaining 100 will prove to be completely immune from such defects when further tested in other languages? And if not, can any universally useful list be postulated?

2. Lexicostatistical theory is based on two assumptions: that the rate of 'morpheme decay' in the basic vocabulary of any one language is constant through time, and that the rate of 'morpheme decay' is the same in all languages. Lees[4] has stated that the assumption of a temporally constant rate has not been checked and that, as yet, there is no data available with which to check it beyond a couple of thousand years of time depth. He has also presented evidence against as well as in favor of the reliability of the assumption that the rate of decay is the same in all languages. The positive evidence is based on thirteen test cases—languages in which test items are available from written records covering a span of up to 2200 years. More recently Swadesh[5] has discarded as invalid ten of the thirteen test cases used by Lees, because of: overlapping development (e.g. Athenian and Cypriote); inaccurate scoring (e. g. Swedish); uncertainty as to the direct

[1] Sarah C. Gudschinsky, Lexico-Statistical Skewing from Dialect Borrowing, IJAL 21.138-49 (1955), p. 149; and The ABC's of Lexicostatistics (Glottochronology), manuscript in preparation.

[2] Robert B. Lees, The Basis of Glottochronology, Language 29.113-27 (1953), p. 114.

[3] Morris Swadesh, Towards Greater Accuracy in Lexicostatistic Dating, IJAL 21.121-37 (1955), p. 124–26.

[4] Lees, op. cit. p. 121.

[5] Swadesh, op. cit. pp. 128–31 and p. 122.

descent of the more recent language from the older (e.g. Coptic). In the same article, however, he says, 'Within the field of linguistics itself, lexicostatistics brings to light a previously undiscovered reality—the tendency of vocabulary to change at a uniform rate.'

Query: Has the 'reality' of the tendency of vocabulary to change at a uniform rate been adequately demonstrated, inasmuch as the demonstration originally based on thirteen test cases used as a statistical sampling of all languages, now rests on only three cases?

3. Swadesh[6] has discussed the possibility of delving 15,000 years into the past to establish Amerindian linguistic relationships dating back to the first peopling of this continent. He proposes the use of lexicostatistics for the classification of these relationships, and he suggests the following terminology based on lexicostatistic results expressed in centuries of divergence: language (0–5 centuries), family (5-25 centuries), stock (25–50 centuries), 'microphylum' (50–75 centuries), 'mesophylum' (75–100 centuries), and 'macrophylum' (over 100 centuries). He also states that, 'It will be necessary some day to add terms for even more remote connections.'

'Macrophylum' on the above scale is the relationship indicated by not more than 5 cognates in a test list of 100 items, if 86% is used as the index of retention. (This is the figure Swadesh currently uses with the 100 word list[7].) The 'more remote connections' would presumably be indicated by even fewer cognates.

Kroeber[8] has pointed out that relationships postulated on the basis of 8 or less percent of cognates in a list of 200 items (i.e. 16 cognates or fewer rest on 'precariously slender evidence', and he recommends that longer lists—1,000 words—be used for the exploration of such time depths. Swadesh himself has said[9] 'Three of them [cognates postulated on the basis of CVC agreements] are almost satisfactory, but less than that are insufficient in themselves to give confidence of genetic connection.' A study by Fairbanks[10] seems to indicate, however, that the probability of resemblances due to chance is greater than Swadesh had estimated, in which case three or four postulated cognates would not be sufficient evidence to show genetic connection.

Query: Is a test list of 100 items an adequate tool for exploring the time depths represented by 'macrophylum' in Swadesh's scale, inasmuch as such classification would depend on fewer cognates than are required for solid evidence of genetic connection? If the 100 word list is not adequate, and if this list truly exhausts the items suitable for such a list, by what means are linguistic phyla and 'even more remote connections' to be classified?

SUMMER INSTITUTE OF LINGUISTICS

COMANCHE LINGUISTIC ACCULTURATION: A CRITIQUE

RUDOLPH C. TROIKE

The contribution of linguistics to acculturation has been discussed by Beals[1] in the following manner: 'Studies thus far published are relatively preliminary and have included few theoretical statements. Generally, stress has been laid upon the interrelationship between sociocultural and linguistic factors in change. Despite some suggestion that linguistic studies could provide indices for acculturation, the field is little developed . . .'

Joseph Casagrande has made a pioneer attempt to develop this neglected field, in a

[6] Morris Swadesh, Perspectives and Problems of Amerindian Comparative Linguistics, Word 10.306-32 (1954), pp. 306-8 and p. 326.

[7] Swadesh, IJAL 21.127 (1955).

[8] A. L. Kroeber, Linguistic Time Depth Results So Far and Their Meaning, IJAL 21.91-10 (1955), p. 97.

[9] Swadesh, Word 10.321 (1954).

[10] Gordon H. Fairbanks, A Note on Glottochronology, IJAL 21.116-20 (1955).

[1] Ralph Beals. Acculturation. Anthropology Today, A. L. Kroeber, ed. Chicago (1953), p. 635.

series of studies on Comanche linguistic acculturation.[2] These articles present a wide variety of linguistic data, individual and collective, bearing upon Comanche acculturation. Most important, the material is made a basis for a series of postulates for linguistic acculturation.[3] These formulations attempt to define a field of investigation and hold promise of great significance for both acculturation and linguistics. However, if studies in this subject area are to have meaningful results, there must be some basic agreements on operational concepts and terms.

The field which 'linguistic acculturation' is supposed to specify is already amply covered by alternative terms. Besides the more generic 'language borrowing' (Bloomfield), there are 'languages in contact' (Weinreich), 'language contacts' (Vogt), or 'language and acculturation' (Social Science Research Committee). Martinet[4] has registered a protest against the term employed by Casagrande. He complains that anthropological linguists raise terminological barriers through the use of "jargon, with words like 'overt,' 'covert,' 'acculturation' used for concepts with which more traditional linguistics had long since been operating under different labels." While it may be difficult for one who understands and uses these terms to sympathize with such a criticism, it must also be a painful experience for a life-long linguist in another field to find that he must learn a whole new vocabulary merely to comprehend some old ideas which have been stylishly reverbalized.

Since some linguists are also anthropologists, the study of acculturation is properly a part of their concern. Linguistic data, as shown by Casagrande, can be used to study acculturation in the following ways:

1. The vocabulary furnishes an index of acculturation.

2. Fossil or memory words may indicate lost cultural content.

3. Details of ethnohistory may be reconstructed by lexical comparison.

4. Observations provide material for metalinguistic and psycholinguistic inferences.

5. Structural or systematic changes in phonology, morphology, syntax, or lexicon can be described.

Casagrande gratuitously includes all of these topics in the subject matter of 'linguistic acculturation.' But in doing so he badly confuses the theoretical orientations of both acculturation and linguistics. The first four categories above are macrolinguistic by Trager's definition, since they are concerned only secondarily with the language itself. Rather these belong to the 'cultural inventory' view of language and are concerned with using linguistic evidence to study contact effects on the total culture. Such a title as 'language and acculturation' would be more appropriate for these topics. Some of them could perhaps be systematized within a treatment of 'metalinguistic acculturation,' but such a field is not yet extant. The fifth category cannot logically be classed with them, since it relates directly to the language itself as a part of the culture, i.e. it is microlinguistic. Where the language is treated in its formal aspects as a system, changes may be considered without reference to other facts of culture.

'Acculturation' formalizes the concept of alterations in sociocultural systems following upon contact. 'Linguistic acculturation' therefore should refer to changes in the phonemic, morphemic, syntactic, and semantic systems (or structures) of a language as a result of influences from external linguistic systems (mediated always through the users of these systems). The broadly inclusive use of the term by Casagrande

[2] Joseph Casagrande. Comanche Linguistic Acculturation. IJAL 20.140-51, 217-37; 21.8-25 (1954-55).

[3] Casagrande. Ibid. 21.22-5.

[4] Andre Martinet. The Unity of Linguistics. Word 10.124 (1954).

and others could lessen the opportunity for linguistics to make a maximum contribution to acculturation theory.

Acculturation studies today include two descriptive levels: the institutional or cultural and the individual or psychological. Beals[5] suggests that 'a clear understanding of and division between sociocultural and psychological phenomena and explanations should be established.' In the absence of any neologisms, 'acculturation' is and has been used in the specific sense regarding individuals, idiolects, and items of material culture. The limiting requirement is that these subjects be not considered as isolated totalities, but in a partitive sense as bearing representative qualities of the total culture.

In this case reference to the entire range of modification in an individual's use of his language (a culturally-derived system) as a result of contact with other-language speakers, may be termed 'linguistic acculturation.'[6] For the purposes of studying individual linguistic acculturation, we define the individual as the culture-bearing unit and as the unit of variation and selection in culture change. Linguists generally recognize that bilingualism is one of the underlying mechanisms in linguistic change. The two uses for the term 'acculturation' thus illustrated must be kept rigorously apart in order to prevent any further ambiguity and confusion.

It is apparent from Casagrande's work that linguistics does have great contributions to make to acculturational studies and theory. He has done much to show the extent of these possibilities. There still needs to be some refinement of terms and concepts to expedite effective achievement in this hybrid field. There must be a first realization that for linguistics, the subject matter of the inquiry are the patterns of linguistic behavior. This in part defines the relevance of the material to be examined. For the linguist, the data provide the raw material for determining changes in the patterns or systems of the language. Since idiosyncratic activities are capable of description, but are not fully comprehended within the configurations studied by linguistics and anthropologists, the remaining information on individual language-use will be valuable to the social psychologist.

It is at all events desirable to avoid ambiguity of result or purpose by keeping these areas of relevance separate. To accomplish this, the investigator should make explicit his assumptions, define his terms, and express the purposes of his classifications, especially in a new field where this has not been done before. As Beals concluded: 'There is an urgent necessity to re-examine our conceptual apparatus and to reach agreement on objectives and methods which will produce more comparability in studies and which will develop a series of really significant hypotheses.'[7]

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[5] Beals. Op. cit. p. 638.

[6] Weinreich's definition of 'interference' as given in 1.1 of Languages in Contact (1953) may be taken as roughly equivalent for certain purposes.

[7] Beals. Op. cit. p. 638.

A NEW LINGUISTIC SERIES

Oceania (26.151) announces the beginning of a new series of linguistic monographs, to be published by Oceania and the University of Sydney under the editorship of A. Capell and S. Wurm. The series will be devoted to Oceanic languages. Volume one, now in press, will be A. Capell, A New Approach to Australian Linguistics; projected volumes include: W. E. Smythe, Grammar of the Bandalong Language (North Coast of New South Wales) and S. Wurm, Analysis of the Nifilole Language (Reef Ids, St. Cruz) and a volume on the languages of Western Papua. For further information, address Dr. A. Capell, Department of Anthropology, University of Sydney.

Society for Ethno-musicology

At the 54th annual meeting of the American Anthropological Association in Boston, the Society for Ethno-Musicology was founded November 18, 1955, for the purpose of establishing communication among persons interested in primitive, folk, and oriental music, and for furthering research and scholarship in these fields. The Society plans to continue publication of the Ethno-Musicology Newsletter three times yearly, to meet annually in conjunction with societies of anthropologists, folklorists and musicologists, and to engage in other activities of benefit to members. The Society has made an arrangement with Folkways Records and Service Corporation whereby members may obtain records and publications of this company at a discount of 33%, tax included.

The following officers were elected: Willard Rhodes, President; Mieczyslaw Kolinski, Vice-President; David P. McAllester, Secretary-Treasurer; Alan P. Merriam, Editor; Bruno Nettl and Charles Seeger, Councillors. Additional councillors will be named later.

Membership is open to all interested persons. Dues are $2.00 yearly, payable to the Sec.-Treas., Psychological Laboratory, Wesleyan University, Middletown, Connecticut.

Recent Publications

General Linguistics

Geist, Robert J. Structural Grammar and the Sixth Grade. American Speech 31.5–12, 1956.

Goldschmidt, Walter. Language and Culture: A Reply. Quarterly Jour. of Speech 41.279–283, 1955. [A reply to Pulgram's article listed below.]

Harwood, F. W. Axiomatic Syntax: The Construction and Evaluation of a Syntactic Calculus. Lg 31.409–413, 1955.

Hattori, Shiro. A Glottochronological Study of Three Okinawan Dialects. Japanese Jour. of Ethnology 19.36–45, 1955. [In Japanese, with a summary in English.]

Haugen, Einar. Linguists and the Wartime Program of Language Teaching. Mod. Lg. Journal 39.243–245, 1955.

Ladefoged, Peter. The Classification of Vowels. Lingua 5.113–128, 1956.

Linguistic Bibliography for the year 1953 and Supplement for Previous Years. Utrecht-Anvers (Spectrum): Permanent International Committee of Linguists, 1955. xxx + 353 pp.

Mikus, Francis. Jan V. Roszwadowski et le Structuralisme syntagmatique. Lingua 5.1–44, 1955, and 5.129–143, 1956.

Mol, H. and E. M. Uhlenbeck. The Linguistic Relevance of Intensity in Stress. Lingua 5.205–213, 1956.

Peterson, Gordon E. An Oral Communication Model. Lg 31.414–427, 1955.

Pike, Kenneth L. Language in Relation to a Unified Theory of the Structure of Human Behavior. Part II, Prelim. Ed. Glendale, Calif.: Summer Institute of Linguistics, 1955. v + 85 pp.

Pulgram, Ernst. Language and National Character. Quarterly Jour. of Speech 40.393–400, 1954.

Putnam, George N. and Edna M. O'Hern. The Status Significance of an Isolated Urban Dialect. Linguistic Society of America: Language Diss. no. 53, 1956. 32 pp.

Richards, I. A. Speculative Instruments. Chicago: Univ. of Chicago Press, 1955. xii + 216 pp. [A collection of previously published papers, some of which bear upon problems of semiotic.]

Romportl, Milan. Zum Problem der Fragemelodie. Lingua 5.87–108, 1955.

Voegelin, C. F. On Developing New Typologies, and Revising Old Ones. SJA 11.355–360, 1955.

Weinstein, Ruth H. (ed.) Report on the Sixth Annual Round Table Meeting on Linguistics and Language Teaching. Mono. Series no. 6, 1955. Washington, D. C.: Georgetown Univ. 195 pp.

American Indian Languages

Bibliografia de Obras Generales y Especializadas del Instituto Linguistico del Verano. Summer Inst. of Linguistics, 1955. 48 pp.

Caudmont, Jean. La Lengua Chamí. I. Análisis de los Fonemas. Rev. Colombiana de Antropologia 4.273–284, 1955.

Cowan, Marion M. and Marjorie E. Davis. Hymn Writing in Aboriginal Languages. Summer Inst. of Linguistics, 1955. 28 pp.

Florez, Luis. Algunas Voces Indígenas en el Español de Colombia. Rev. Colombiana de Antropologia 4.285–310, 1955.

Newman, Stanley. Vocabulary Levels: Zuñi Sacred and Slang Usage. SJA 11.345–354, 1955.

Stevens, C. J. Soul Savers, Grammarians, and the Red Man. American Speech 31.40–51, 1956.

Other Languages

Conklin, Harold C. Hanunóo Color Categories. SJA 11.339–344, 1955. [Color terms in a Philippine language.]

Greenberg, Joseph H. Studies in African Linguistic Classification. New Haven: Compass Pub. Co., 1955. 116 pp. [A photo offset reprint of Greenberg's articles in the Southwestern Journal of Anthropology 5.79–100, 190–198, 309–317 (1949); 6.47–63, 143–160, 223–237, 388–398 (1950); 10.405–415 (1954).]

Hall, Robert A. Jr. Innovations in Melanesian Pidgin (Neo-Melanesian). Oceania 26.91–109, 1955.

Hencken, Hugh. Indo-European Languages and Archeology. Memoir 84, AAA, 1955. 68 pp.

Reifer, Mary. Dictionary of New Words [In English]. N. Y.: The Philosophical Library, 1955. ix + 234 pp.

Shipley, Joseph T. (ed.). Dictionary of Early English. N. Y.: Philosophical Library, 1955. xiii + 753 pp.

Trager, George L. The Language of America. AA 57.1182–1193, 1955.

Periodicals Received

America Indigena, v. XVI, no. 1, 1956.

American Speech. v. 30, no. 4, 1955; v. 31, no. 1, 1956.

Antropologia e Historia de Guatemala, v. VI, nos. 1, 2, 1954.

Archivos Venezolanos de Folklore. Año II–III. Tomo II. Núm. 3, 1953–54.

Archivum Linguisticum, v. 7, fasc. 1, 1955.

Boletin Indigenista, v. XV, no. 4, 1955.

Jahrbuch des Museums für Völkerkunde zu Leipzig, Bd. 13/1954, 1955.

The Japanese Journal of Ethnology, v. 19, no. 2, 1955.

Language, v. 31, no. 3, 1955; v. 31, no. 4 (Parts 1, 2), 1956.

Lingua, v. 5, nos. 1, 2, 1955, 1956.

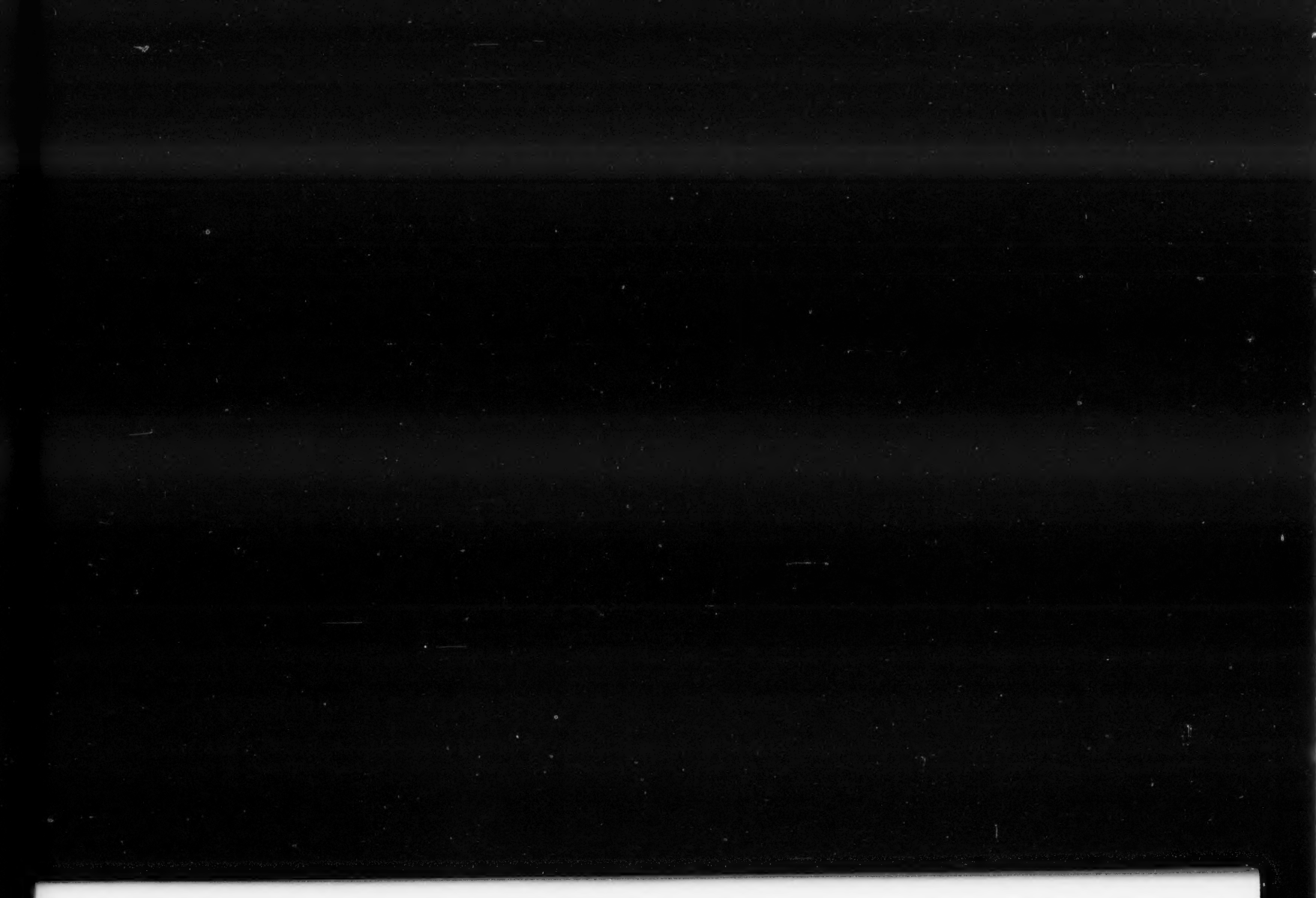
The Muslim World, v. 45, no. 4, 1955; v. 46, no. 1, 1956.

Oceania, v. 26, nos. 1, 2, 1955.

PMLA, v. 70, no. 5, 1955, v. 71, no. 1, 1956.

Revista Colombiana de Antropologia. v. 4, 1955. Bogota.

Change in Subscription Rates for IJAL

The current subscription rate for IJAL is $4.00 a year and includes, without additional cost, two memoir series—Indiana University Publications in Anthropology and Linguistics, and Publications of the Research Center in Anthropology, Folklore, and Linguistics. An increase in the number of memoirs which accompany the Journal necessitates an increase in subscription rates.

Beginning with Volume 23 (1957) subscriptions will be $5.00 a year (student rate $2.50). Bills sent out for renewals this fall will be at the new rate. New subscriptions for 1957 will be accepted at the new rate.